Session 7: Preservation: Special Collections
Moderator: Samuela Nakalevu

THE RESTORATION, CONSERVATION AND DIGITIZATION OF RARE BOOKS OF THE VIETNAM INSITUTTE OF OCEANOGRAPHY (VNIO) LIBRARY

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Abstract:
From the 19th century on, many oceanography books were published, marking the development of oceanography science. The Vietnam Institute of Oceanography was founded in 1922. Its Library has a valuable collection of rare books, such as *The Siboga Expedition* (a scientific Dutch zoological and hydrographical expedition to Indonesia from March 1899 to February 1900), *The fishes of India* (by Francis Day, 1878), and *The voyage of HMS Challenger from 1872 to 1876*. This rare book collection not only contains history but is also a very useful reference in current oceanography science. Vietnam is a tropical country and temperature and humidity are always high, conditions that are not good for the conservation of books. Because some of these books crumble very easily and we have limited experience and lack of professional equipment, we categorize them as unable to be processed. In other cases we make archival boxes for books or digitize them by scanning or taking pictures using a digital camera. All scanned files and photo files are stored at least in 150dpi resolution. Then we combine them page by page to create PDF files and store them in PC hard disks and DVD ROMs. In February 2012, with the support of the Intergovernmental Oceanographic Data and Information Exchange (IODE/UNESCO, IOC), Mrs, Linda Pikula & Prof. Nancy E. Kraft, experts of Ocean Teacher Academy/IODE, visited our library and guided us on many techniques for book and paper conservation and how to preserve digital books. In future we wish to continue conservation and digitization and would also like to restore other books. However, we have limited knowledge and look forward to international cooperation to maintain the rare books; they are a resource not only for Vietnam but also for oceanographers in general. Since many old oceanography books have been digitized and are archived in various digital libraries, perhaps IAMSLIC could create a directory/bibliography for all digitized oceanography books.

Keywords: Oceanography, rare books, Vietnam Institute of Oceangraphy, digitization, book conservation, libraries.

The **Institute of Oceanography in Nhatrang** is an oceanography institute located next to Cau Da Wharf, about 6km from the centre of Nha Trang city, KhanhHoa Province, Vietnam. Established in 1922, it was one of the first centers for scientific research in Vietnam and is an important location for tropical

oceanographic research. The National Oceanographic Museum is located next to the Institute and has more than 20,000 sea and freshwater creatures on display.

I. Introduction

Vietnam is situated in the tropical monsoon area of Southeast Asia. It has a coastline of 3260 km. In a country where half of the population lives on the coast and depends on the sea for its livelihood, so the importance of Vietnam's Institute of Oceanography (VNIO) is undeniable. The Institute began its life as the Service Oceanographique des Pêches de l'Indochine in 1922, becoming the Institute of Oceanographique de l'Indochine in 1930.

The Institute's Library, founded in 1922, is a specialized oceanographic library for Vietnam. It has become famous for its collection of original historical books on the oceanography of the world published during the 18th and 19th centuries.

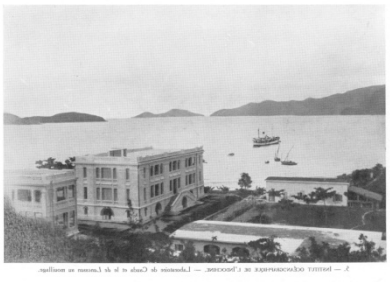

Figure 1. Institut Océanographique de L'Indochine: Laboratoire de Cauda et le de Lanessan au mouillage (1926).

Figure 2. Institut Océanographique de L'Indochine: Laboratoire de Cauda La collection de moulages de poissons destinés à l'exposition coloniale int ernationale de Paris.

Figure 3. Vietnam Institute of Oceanography.

II. VNIO's Library's Historical Collection

The historical and sometimes rare collection of oceanographic materials includes over 83 collections (284 volumes/books) published between 1879 and 1924, as well as eight journals published between 1802 and 1956.

Many of these books have valuable historical information concerning maritime Southeast Asia and other parts of the world. For example: the *Siboga Expedition*, a Dutch scientific, zoological and hydrographical expedition to Indonesia from March 1899 to February 1900; *The Fishes of India: being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma and Ceylon,* written in 1878 by Francis Day, an Inspector-General of Fisheries in India and Burma and a pioneer ichthyologist who first described over 300 marine and freshwater fishes of British India; *Voyage autour du monde par les mers de l'Inde et de la Chine de la corvette de sa Majest La Favorite execute pendant les années 1830, 1831, 1832 sous le commandement de M. Laplace*; etc. Texts like these have been a valuable source of information to marine biologists at VNIO and visiting international scientists.

These old, unique and sometimes rare books are a treasure in our library as well as being important to the history of oceanography. However, with the passage of time, extreme heat, insect attacks and lack of preservation, many of these books have been damaged and are in danger of decomposition.

III. Factors Contributing to the Deterioration of the VNIO Historical Collection
The following factors contribute to the deterioration of materials in the VNIO Library:

- Environmental and biological factors:
  - Heat, humidity and moisture. Vietnam has a tropical monsoon climate that also influences variations in tropical humidity. In general there are two seasons in Vietnam: the cold season from November to April, and the hot season from May to October. Every year there are approximately 100 rainy days with an average rainfall of 1,500 to 2,000 mm. The humidity is about 80 percent. There are about 1,500 to 2,000 sunny hours and an average solar radiation of 100 kcal/cm^2 in a year. The annual average temperatures range from 22 degrees C to 27 degrees C (37 degrees C in the summer).
  - Light. The VNIO Library has many windows, and light directly affects the books.
  - Cement, coal, dust. The VNIO Library is near a cargo port. In the summer when it is very hot, we must open the windows, so coal and cement dust from the port drift through the windows.
  - The high heat causes dehydration of cellulose fibers in the books and the paper becomes brittle. The paper loses its flexibility to the extent that it crumbles to the touch. The high temperature combined with the high humidity creates a perfect condition for the growth of molds and termites. The moisture caused by humidity weakens adhesives and makes the book bindings loose. It also weakens the sizing elements of the paper and causes a spreading of the ink.
- Human and Chemical Factors:
  - Prior to digitizing these books, the taxonomists physically handled the books during classification of marine plants and animals in the laboratory. The books deteriorated due to exposure to seawater, formalin, and alcohol in the specimen containers.

IV. Lessons Learned
We have learned to limit the environmental factors and biological factors by using many fans to circulate the air and reduce the temperature and humidity. We have also begun to spray pesticides to protect against termites and other vermin.

We have not been able to change human behavior. Scientists still handle reading materials in the laboratory during the classification of samples since they need the books to compare specimens.

Organizations	Year	Sponsors	Objectives/Activities/Results
British Council in Vietnam	1997 - 1998	4 air conditioners 2 air dryers 2 vacuum cleaners 2 PC's 1 Flatbed scanner HP ScanJet 4C – A3	-Reduce negative environmental factors for preservation of rare books -Digitize *The Voyage of HMS Challenger* (vols. 1-12: 20 books) (*)
The Royal Danish Embassy in Vietnam And the Danish International Development Agency *(*DANIDA*)* in Vietnam	1997 - 1998	1 new building (1 floor) near old library building	-Opening of reading room -New place for precious books
Scripps Institution of Oceanography	2001	1 PC 1 Flatbed scanner HP ScanJet 2410 - A4 100 CD - ROM	-Digitize *The Voyage of HMS Challenger* (vols. 13 - 32: 30 books) (**) Result of Digitization of *The Voyage of HMS Challenger: (*) & (**)* -32 Volumes (50 books) digitized stocked in USB and CD – ROM -Contains (file image): 32.386 files Bitmap; Size on disk: 3.98 GB - Contains (file image transferred in file PDF, 1 file PDF = 1 book): 50 files PDF; Size on disk: 453 MB Resolution (DPI): 150 Picture type: Colour
Vietnam Academy of Science and Technology	2008	4 PC's 1 Camera Canon PowerShot SX 100IS 1 Flatbed scanner HP Scanjet G4010-A4 1 USB 12 GB 1 USB 500 GB	Digitized T*he Siboga Expedition 1894-1900 (1902-1950).* 40 books digitized, stocked in USB Contains: 163 filed PDF (40 books) Size on disc: 3.03 GB Resolution (DPI):200 Picture type: Colour

Table 1. Sponsors from 1997-2008.

Lessons Learned From the Digitization Of Two Collections:

The digitization of the collection of *The Voyage of the HMS Challenger* utilizing a normal flatbed scanner sometimes made the book covers and binding of the books break and pages crumble. Because of this, we used a digital camera for the digitization of the collection Siboga Expedition 1894-1900. We made a stand for the digital camera that worked like an overhead scanner. By doing this, we avoided breaking the covers and spines of the books. However, the quality of the files canned by this camera is not good.

Sponsorships 2009-2012

With the support of the IOC, IODE OceanTeacher program, three VNIO librarians and staff members attended the following OceanTeacher courses:

- **Digital Asset Management, October 2-7 2009:**
  The Digital Asset Management (DAM) Workshop gave participants the opportunity to explore a wide array of topics typically associated with a DAM infrastructure. Topics relevant to content creation, asset management, and dissemination were presented during the workshop. Over the course of four days, participants had the opportunity to evaluate each topic area presented and develop a concept model based on the needs of the aquatic and marine science community. Several case studies were presented throughout the course and participants working in groups interacted with others with similar asset management needs.
- **Preservation and Archiving of Digital Media, March 22-26 2010:**
  Libraries traditionally have formed a preservation safety net for materials that will be transmitted to subsequent generations of information seekers and scholars. For paper-based documents, provision of adequate storage conditions was the best means to help ensure that materials would remain readable far into the future. With the advent of digital technology, many knowledge creators do their work on computers. Some of that knowledge may be printed on paper, but much of it, particularly databases, geographic information, scientific data sets, and websites, exists only in electronic form. At the same time, traditional forms of publications have changed significantly and, as a result, create new challenges. For example, publishers of electronic journals license their content to libraries, but libraries do not own that content and they may not have rights to capture digital content to preserve it.
  This course examined these questions and provided an introduction to the metadata needed for a digital environment, terminology, cross walking, harvesting, interoperability and metadata frequently used to describe digital collections. Practical hands-on exercises were included. Through a combination of lecture, case studies, and interactive sessions, students learned about the long-term preservation requirements of digital assets.
- **Disaster Planning, Preparedness, and Response, July 01-07, 2010:**
  This course introduced students to various tools and techniques for dealing with damage caused to library resources from accidents due to natural disasters or human error. Preparedness is of utmost importance in the event of a disaster, large or small. Students learned the fundamentals of emergency planning, wrote a disaster plan and learned about other preparations for protection of collections. Participants learned how to air dry wet books and other library materials, conduct a building risk assessment, use protective measures for collections such as boxing, store backup tapes off site, correct shelving techniques, and deal with mold. Students also participated in a table-top disaster response exercise and in a mini-disaster response exercise.
- **Data Curation For Information Professionals and In-Depth Digitization Practicum, September 26-30 2011**:
  Learning Outcomes/Goals:
  - Students will have an advanced knowledge of the current landscape in data curation. Students will understand the e-science mandate and life-cycle and their possible future role in this.
  - Students will have the skill to create an appraisal guide tailored to their particular work place and basic skill in writing data citations in various formats.
  - Students will have the skill to digitize a document and create data citation and deposit to a Repository.
- **Preservation of Books and Other Media, May 21-25, 2012**:

Students learned how to establish preservation practices in a library with limited staff and budget. The course covered responsible stewardship of collections, integration of preservation into daily activities, maximizing limited resources, establishing priorities, and advocacy. Topics included appropriate care of books, papers, photographs (traditional & digital), film and other non-print items. Students learned methods for providing preventive care, including good storage conditions, housing of materials, emergency planning, and careful handling of collections; to identify preservation needs and set priorities; reformatting options including microfilm, paper to paper, and microfilm and paper to digital; and about fundamentals and challenges in preserving digital content. Hands-on activities included mending a book, cleaning a manuscript, and flattening documents. The final project was a written preservation plan for a collection in the student's library.

- **Grantwriting for Digital Projects 2012**:
  Participants learned how to prepare strong grant proposals. Elements of general proposal writing were discussed: mission, purpose, budgets, partnerships, timelines, the value of pilot projects, possible sources of funding, consideration of continuity of project through permanent funding, how to establish priorities, distill essence of their needs in proper format. A bibliography of resources was provided. Examples of weak proposals were presented and critiqued.
  A very practical draft grant proposal was constructed for future use. Students learned methods:
  - To identify the elements of a grant proposal as it relates to their own needs.
  - To locate appropriate sources of funding, including international sources.
  - To follow funders' style and format.
  - To write a well supported and well thought out proposal.
  - To identify a weak proposal.
  Course final product: a draft grant proposal and advocacy presentation

Mission Of Mrs. Linda Pikula & Prof. Nancy E. Kraft At Viet Nam Oceanography Library In February 2012:

In February 2012 the IOC, IODE sent Mrs. Linda Pikula, NOAA and Chair of the IOC, IODE Group of Experts on Marine Information Management and Professor Nancy E. Kraft, Director of the University of IOWA Library Preservation Department (both OceanTeacher Instructors) to Nha Trang, Vietnam VNIO to inspect the historical book collection and general collection, and guide us in conservation, preservation and disaster management techniques. Prior to visiting VNIO, an Excel spreadsheet of the historical collection had been assembled by Dang Thi Hai Yen, Librarian at VNIO.

Ms. Pikula conducted an “environmental scan” on the collection in 2011, indicating which books in the VNIO historical collection had already been digitized and made available on the Internet by other libraries. The spreadsheet was annotated to show the number of other libraries holding these titles. Many of the VNIO titles were not held by many other libraries; 28 titles were held by fewer than 10 other libraries, 23 titles were held by three or fewer other libraries. Forty-nine% of the titles were not digitized and were not available on the Internet in 2011**.**

Digital access to the remaining 51% of the VNIO historical collection is available through some digital projects, including the Internet Archive, Biodiversity Heritage Library, Google Books, Linda Hall Library, National Library of Australia, Scripps Institution and the Hathi Trust. Although “[u]sers affiliated with HathiTrust partner institutions are able to download full-PDFs of all public domain works, and works made available in under Creative Commons licenses … Users who are not affiliated with HathiTrust partner institutions can download [only] single-page PDFs of all public domain works, full-PDFs of works made available under Creative Commons licenses, and full-PDFs of public domain works that are not subject to third-party agreements …. There is

significant overlap of volumes in HathiTrust and Google Book Search and if a book is 'full view' in HathiTrust, it is possible that a PDF of the entire book can be downloaded from Google Book Search. "

During the visit by Ms. Pikula and Ms. Kraft the following were demonstrated:

Proper Book Care:

- Cleaning methods for books.
- Removal of books from shelf by gripping both sides of the spine in the middle of the book (pushing neighboring books on both sides to get a good grip) instead of tugging at the top of the spine.
- Not forcing a book to lie open to 180 degrees, but instead propping up the covers of an open book to decrease the opening angle.
- Not using paper clips, "dog ear" folding or acidic insets to book mark pages.
- Not using rubber bands, self-adhesive tape, or any kind of "leather dressing" or glue on books.

Figures 4, 5 & 6. Prof. Nancy E. Kraft teaching Ms Yen the cleaning methods for books, and not forcing a book to lie open to 180 degrees for displaying.

Good Storage Significantly Prolongs the Life and Usability of Books and Includes:

- A cool room temperature, relatively dry with about a 35% relative humidity, clean and stable environment. Avoid attics, basements, and other locations with a high risk of leaks and environmental extremes.
- Select temperature and humidity appropriate to your climate zone 25 degrees C or lower (cooler is better); between 30-60% relative humidity.
- Minimal exposure to all kind of light; no exposure to direct or intense light.
- Distance from radiators and vents.
- Shelve books of similar size together so that the faces of the covers are maximally supported by the neighbors on each side.
- Keep upright shelved books straight and not leaning. Storing books lying flat is also good.

Digital Considerations:

- Plan carefully, establish your metadata, copyright/intellectual property rights.
- Identify the standards and best practices you plan to follow.
- ALCTS Guidelines: Recommended Minimum Capture Summary as a quick reference guide:

http://www.ala.org/alcts/resources/preserv/minimum-digitization-capture-recommendations

- NARA is less of a quick-reference: Information on Textual, Micrographic and Cartographic Records, Posters and Illustrated Materials: http://www.archives.gov/preservation/products/reformatting/text-cart.html
- Do a test run, make a few scans and test the scans out.
- Determine where the original, archival capture will be stored.
- For oversized, fragile materials, it is best to capture the image with the book face-up.
- With a limited budget, a camera mounted on a copy stand along with appropriate lighting will work.
- The ideal is to use a camera that will capture image as a raw or tiff image, at 400-600 dpi/ppi.
- Always save original photo or scan; edit from a duplicate of your original scanned image.

Rare Book Room Considerations:

- If possible, select an internal room. An internal room will help buffer from outside temperature and humidity and will make it cheaper to maintain a good environment
- Select temperature and humidity appropriate to your climate zone –25 degrees C or lower (cooler is better); between 30-60% relative humidity. Since Nha Trang tends to be hot and humid, 50-55% relative humidity is best with 20 degrees C.
- If air conditioning is too expensive, then focus on an internal room that gets good circulation, is in the "cooler" part of the building.
- The room should be without windows and well ventilated.
- Shelving should be metal or, if wood, lined with heavy, archival paper.
- Storing books in archival boxes will give added protection.
- Include a table for study and research.

Making Archival Boxes for Historical and Rare Books

Ms. Kraft and Ms. Pikula instructed the Librarians at VNIO in how to measure the books for the proper construction of archival storage boxes for the collection; the boxes would be hand made at the University of Iowa Libraries in the United States and shipped to the VNIO Library. Twenty-five archival boxes were shipped in September 2012 to Nha Trang from the University of Iowa Library, Preservation Department.

Figure 7. The University of Iowa Libraries USA sent archival boxes to Library of Viet Nam Institute of Oceanography on September 2012.

Figure 8. Ms. Yen is cleaning old books before storage in archival boxes.

Previous and Subsequent Funding Efforts to Digitize the VNIO Historical and Rare Books
While visiting Nha Trang, Ms.Kraft and Ms. Pikula also visited the Vietnam State Archives in the mountains of Dalat. UNESCO had previously funded the restoration of Vietnamese tablets, and a partnership with Dalat discussed for VNIO. Local Nha Trang colleges also discussed whether there could be a partnership in digitizing with VNIO.

After the first OceanTeacher course on Preservation and Digitization, a presentation was made by Ms.Pikula at the Aquatic Sciences and Fisheries Abstracts Board meeting in Morocco in 2010 to develop a digitization partnership between IODE and ASFA developing country members and the ASFA Grants process. Another presentation by Ms.Kraft and Ms.Pikula was made during the 38th IAMSLIC Conference in Anchorage, Alaska 2012 to present the Vietnam VNIO preservation and digitization project.

Yen Dang prepared a Grant Proposal for the Elsevier Grant**:** Viet Nam: the Program Innovative Libraries in Developing Country 2012 (but this proposal wasn't selected).

Future Projects:
The VNIO Library is now planning to set up The Rare Book Room. These old books introduce the spirit and the history of Oceanography. However, we have limited knowledge regarding the restoration as well as preservation and digitization of this collection and need professional help. We look forward to international cooperation to maintain the historical and rare books.

A Suggestion: Many old books on oceanography have been digitized and archived in different digital libraries. These marine reference materials are very useful for biologists, geologists and especially for taxonomists. Therefore, in my Opinion IAMSLIC should create a directory/bibliography for old books on oceanography that have been digitized from all different sources. These digitized marine reference materials are very useful for biologists, geologists and taxonomists.

http://libraries. ucsd.edu/locations/sio/scripps-archives/index.html
http://celebrating200years.noaa.gov/rarebooks/welcome.html
http://biodiversitylibrary.org
http://archive.org
http://hathtrust.org

The pictures in the visit of Mrs. Linda Pikula & Prof. Nancy E. Kraft at Viet Nam, 2012

Before planning to make archival boxes for the collections of rare books not yet digitized:

- Martini, F.N.Q., 1769-1795. *Revues Schematiques Conchylien Cabinet. Rurnberg* (14 volumes);
- Siebold, F. D., 1833-1850. *Fauna Japonica* (4 volumes);
- Day, Francis, 1878. *The Fishes of India* (2 volumes);
- Edwards, H.M., 1857-1860. *Histoire naturelle des Coralliaires ou Polypes Proprement Dits* (3 volumes).

Figure 9. VNIO librarians, Mrs. Linda Pikula & Prof. Nancy E. Kraft checking list of old books.

Figure 10. Books: Siebold, F. D., 1833-1850. Fauna Japonica *(4 volumes).*

Figure 11. Books: Day, Francis (1878), The Fishes of India *(2 volumes).*

Figure 12. Mrs, Linda Pikula & Prof. Nancy E. Kraft checked and measured each book.

Figure 13. Each book had to be measured in several places to find the highest, widest deepest part in order to know how large to make each box.

Figure 14. The rare books in archival books made by the University of Iowa Libraries, USA.